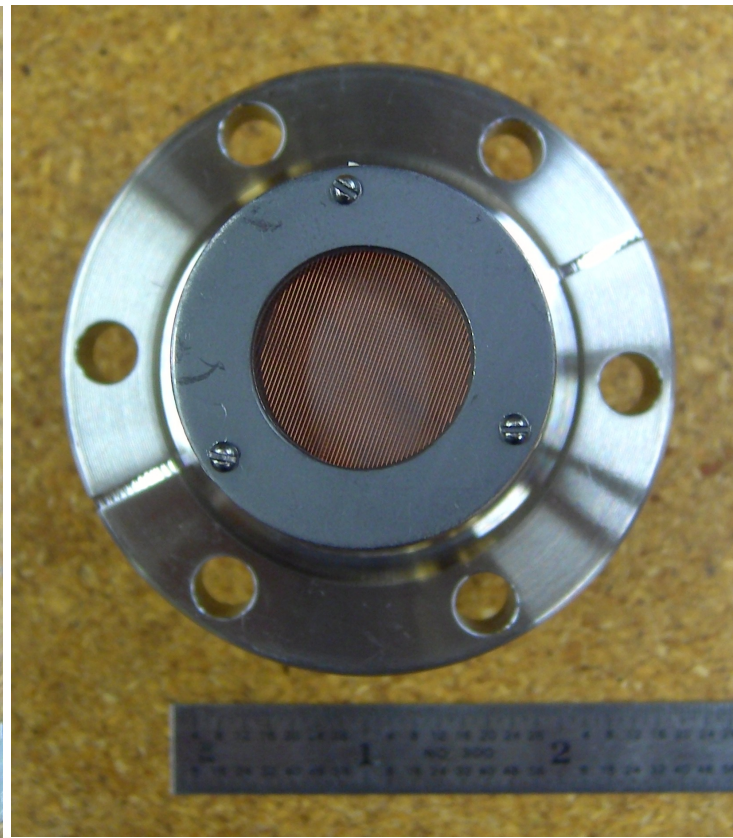
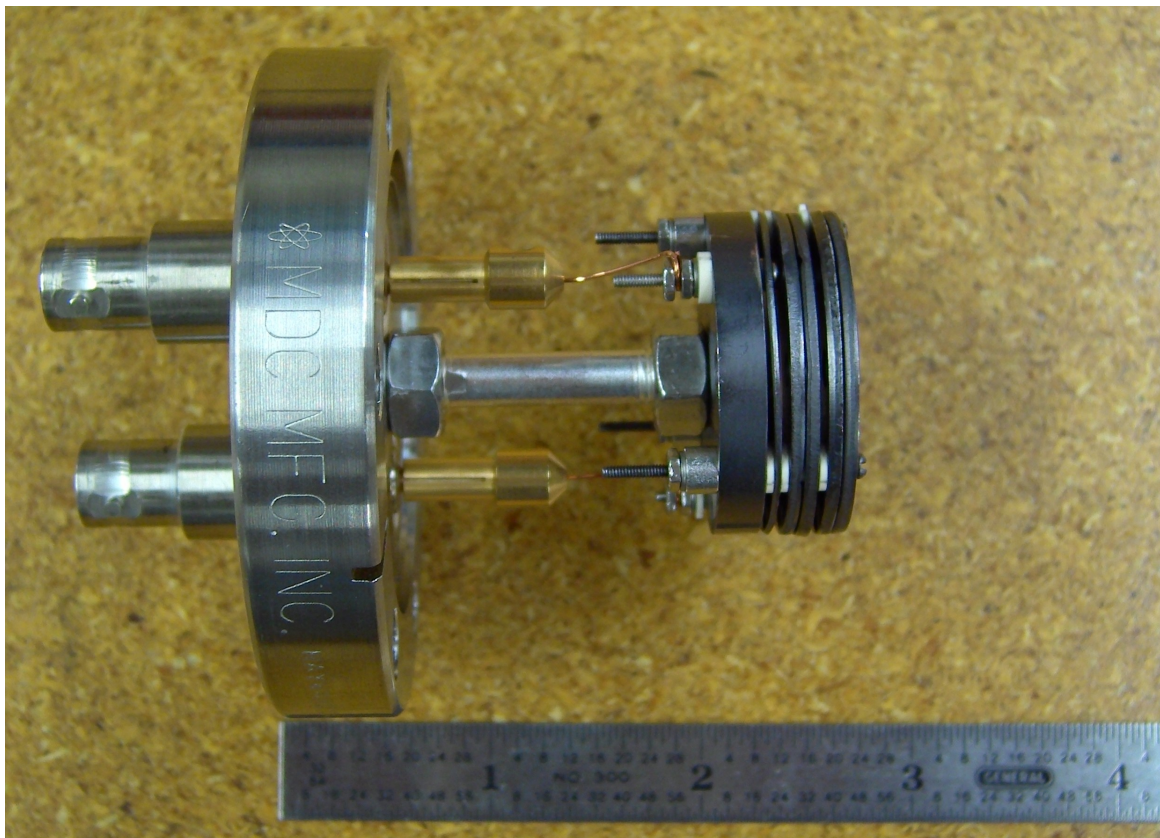


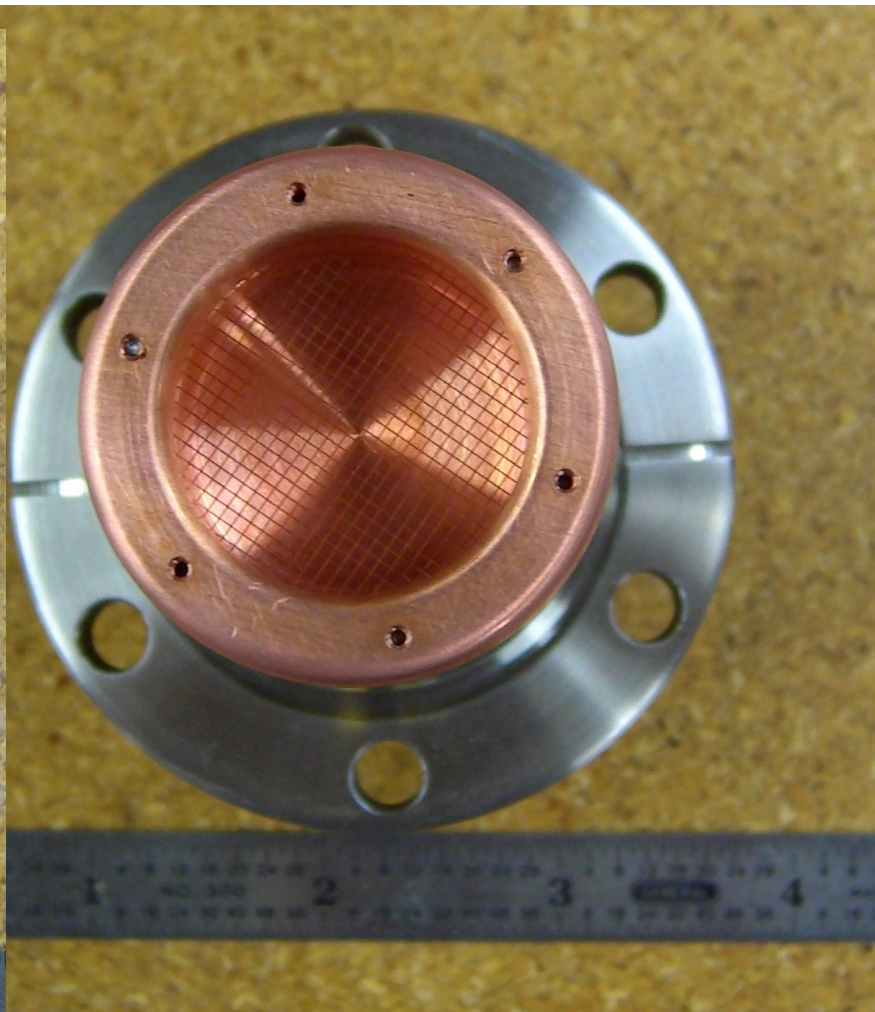
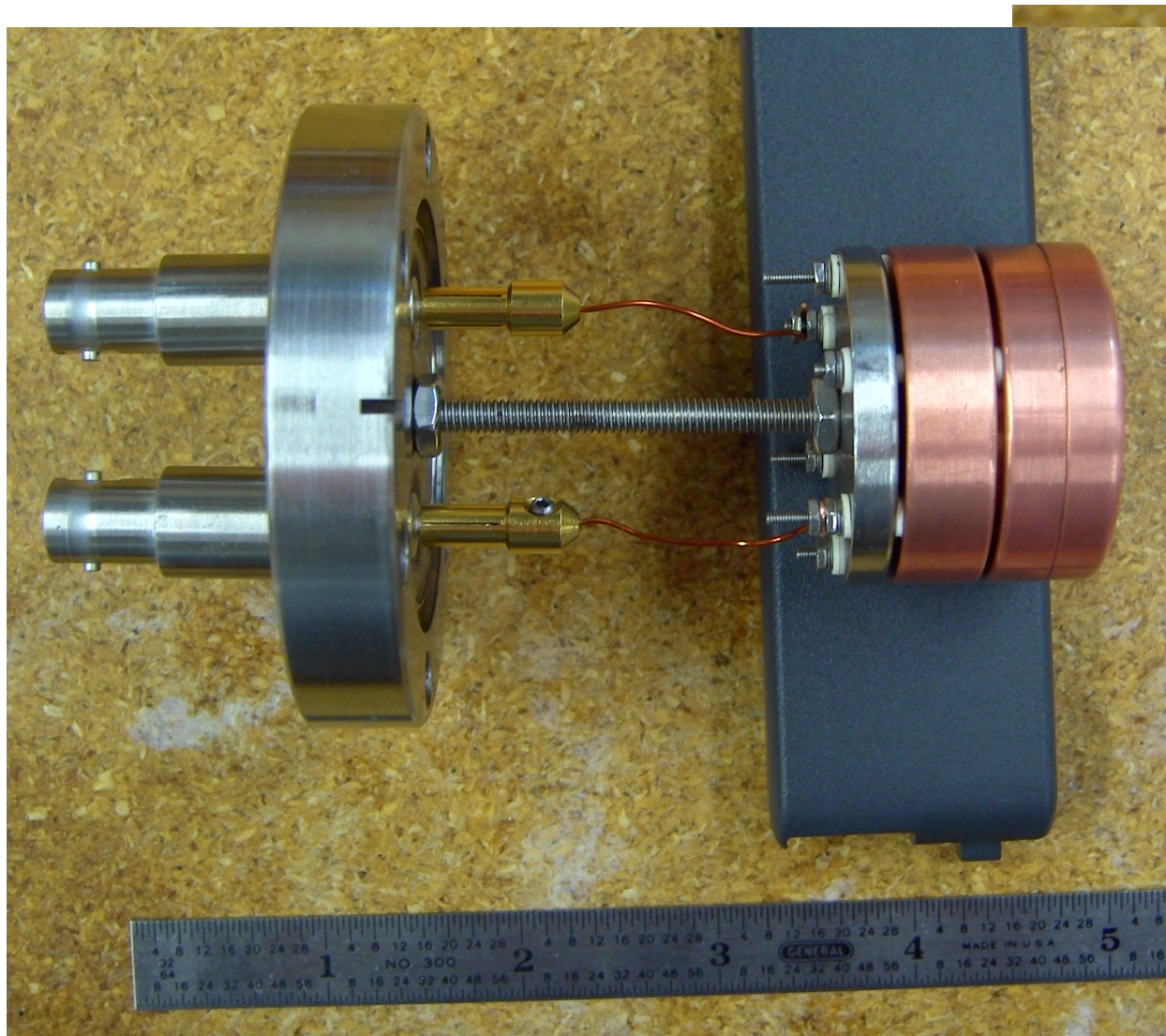
Preliminary Measurements of RFA Prototype and Beam Measurements

C.Y. Tan
23 Dec 2008

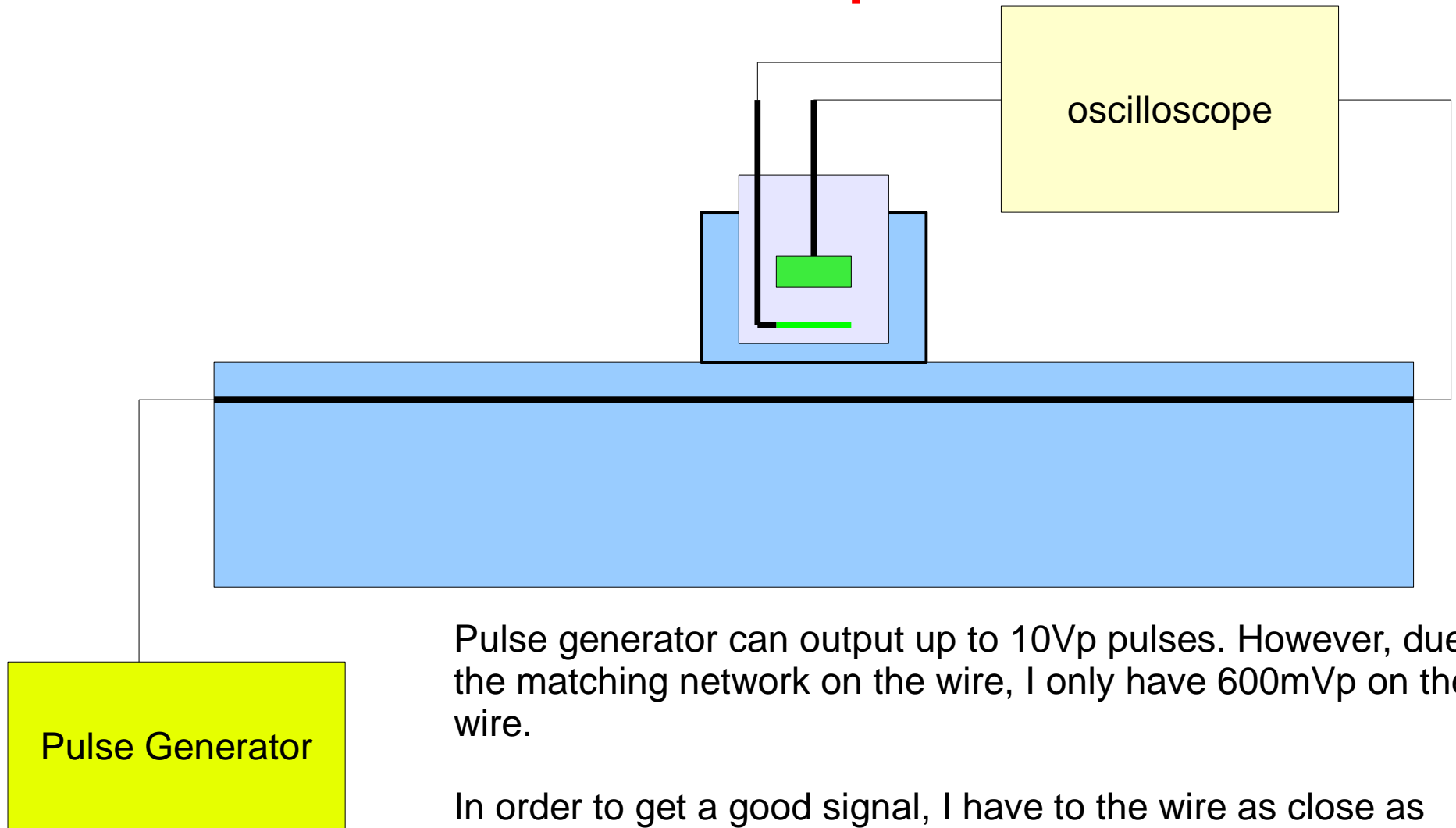
Argonne RFA



FNAL RFA



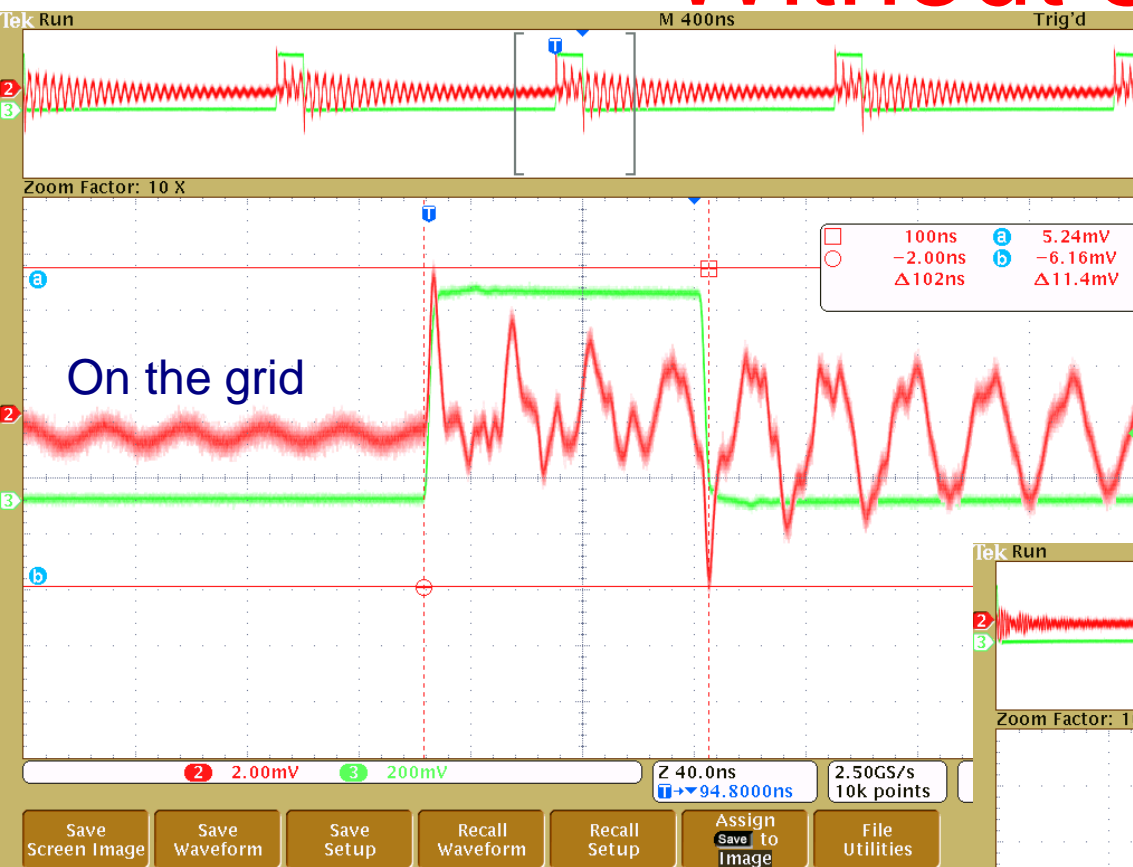
Setup



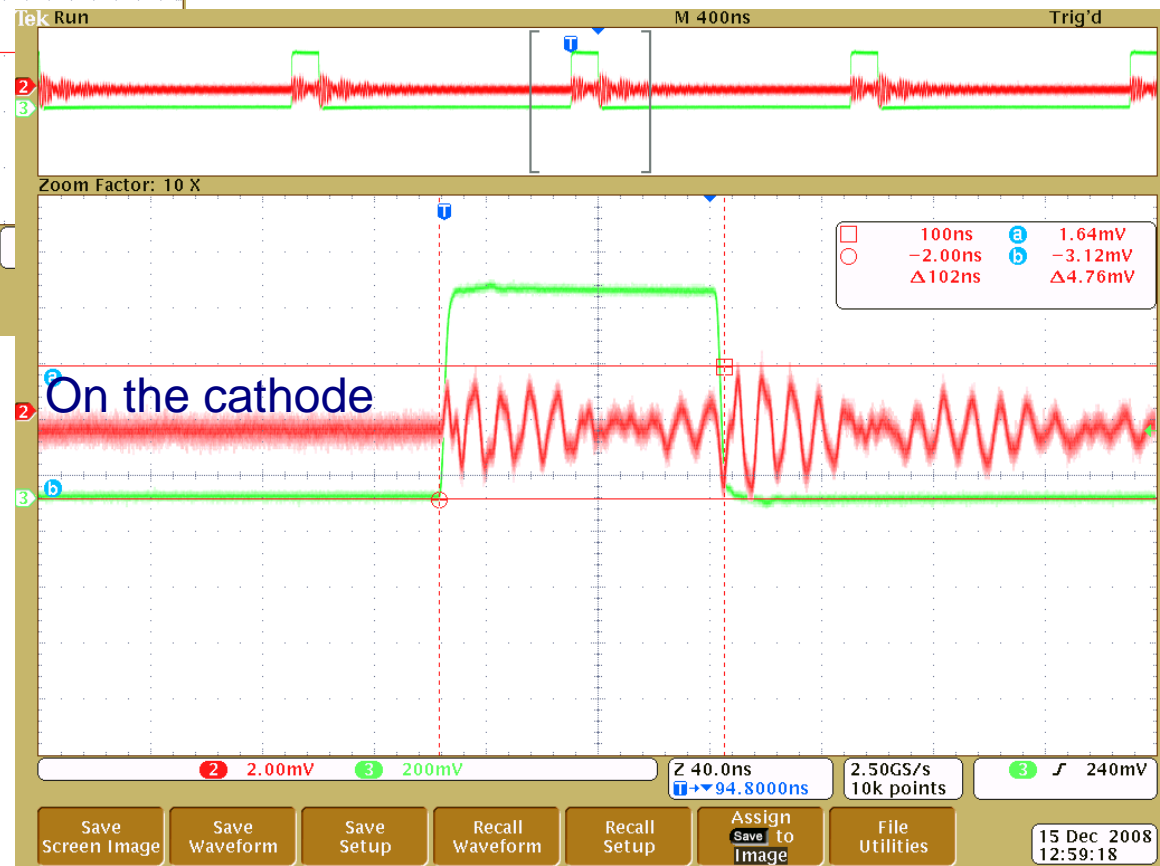
Pulse generator can output up to 10Vp pulses. However, due to the matching network on the wire, I only have 600mVp on the wire.

In order to get a good signal, I have to be as close as possible to the wire as possible to the RFA. The bottom of the RFA is about 1/2" to the wire.

Without slots



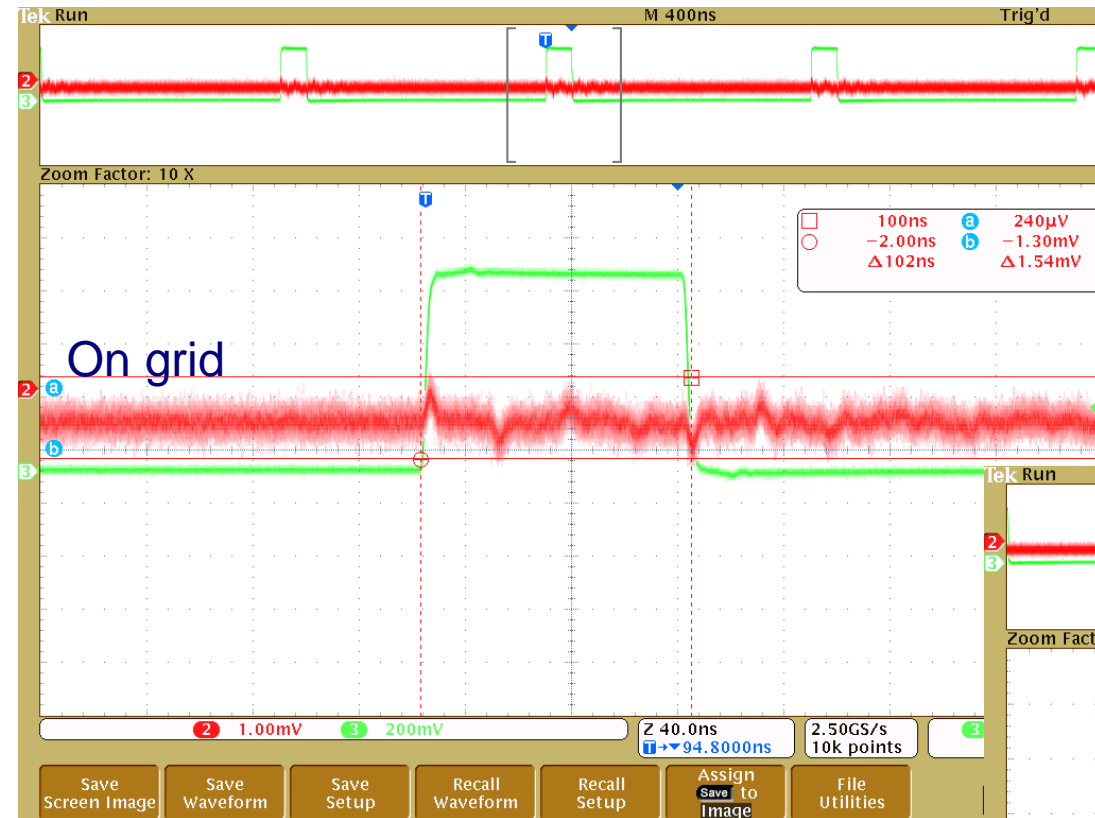
Note: clearly not matched to the input pulse which is 100ns in width. (green trace).



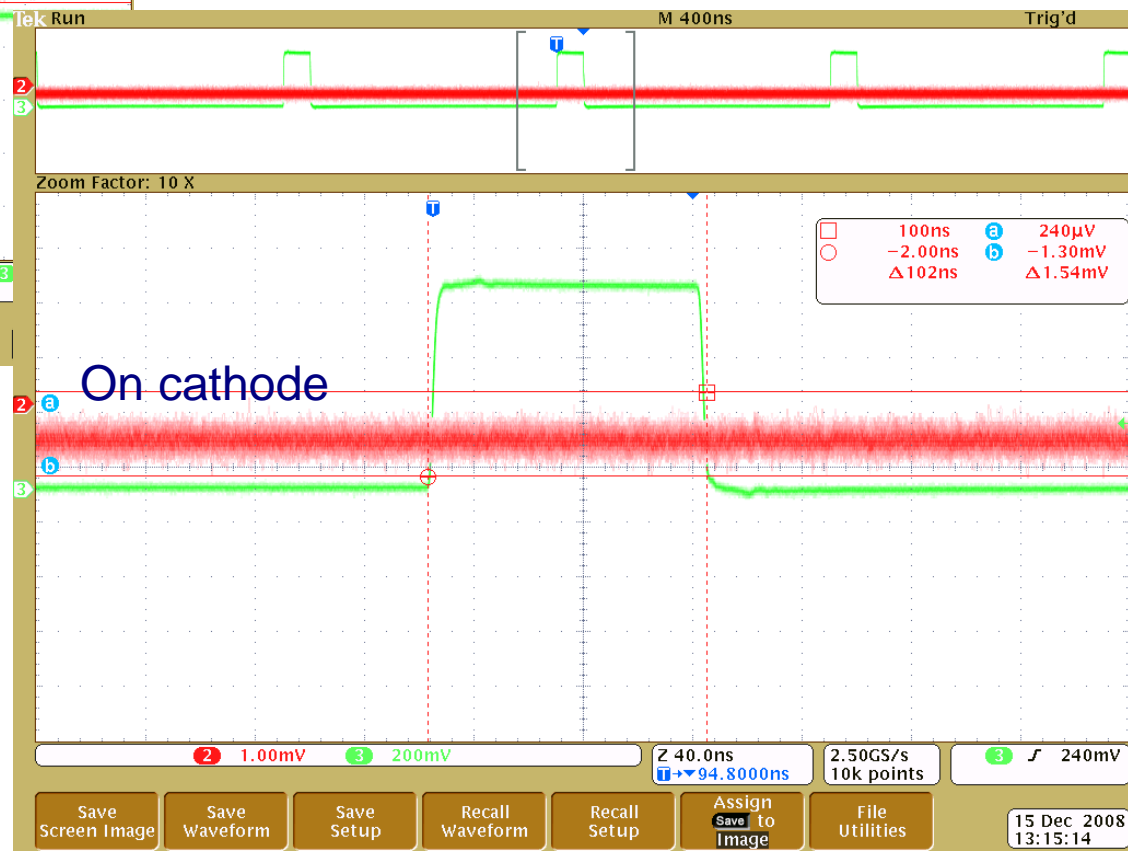
Attenuation Factor:
 $4.76/11.4 = 0.41 = -7.6 \text{ dB}$

Add Slots

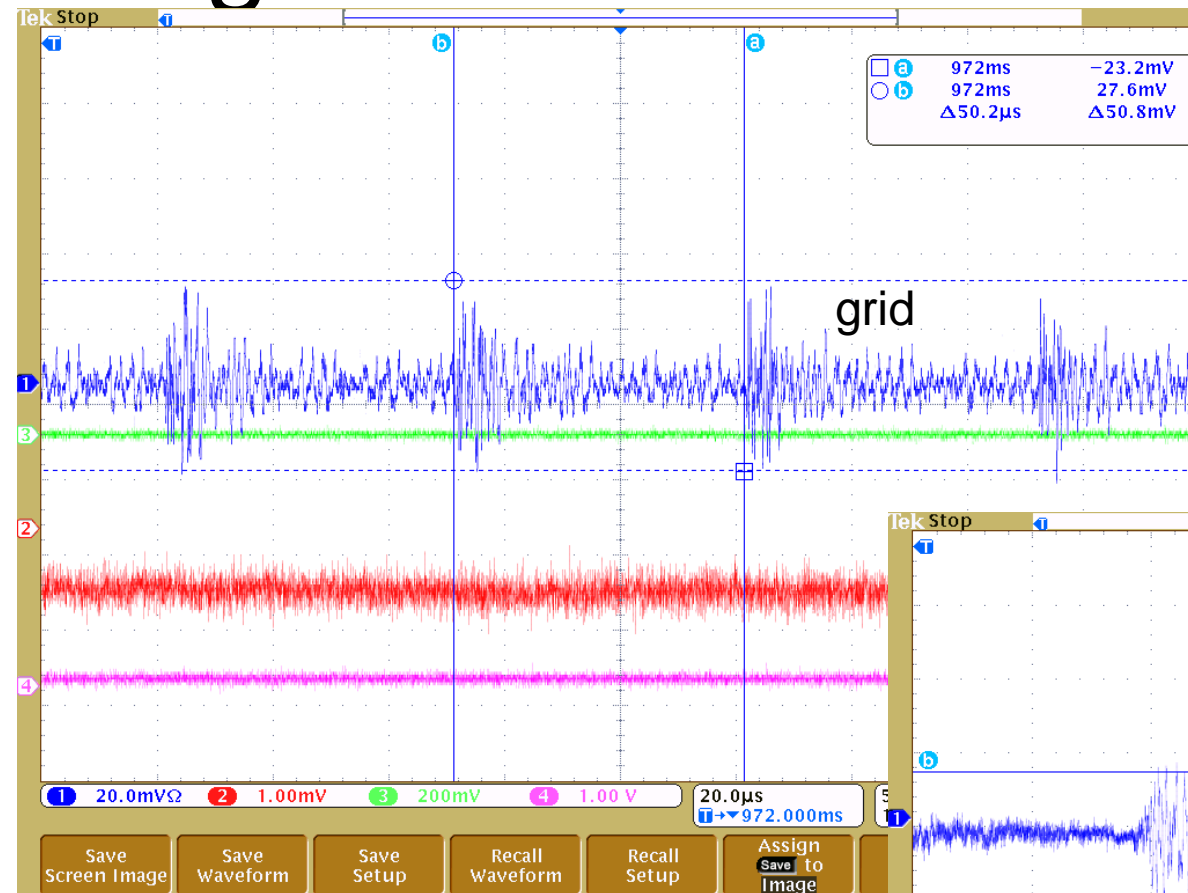
The addition of slots reduces the signal from the pulse quite a bit. In fact attenuation factor is:
 $1.54/11.4 = 0.13 = -17.4\text{dB}$



I cannot see anything on the cathode. Using previous attenuation numbers, the pulse is attenuated by:
 $-(17.4 + 7.6) = -25\text{dB}$

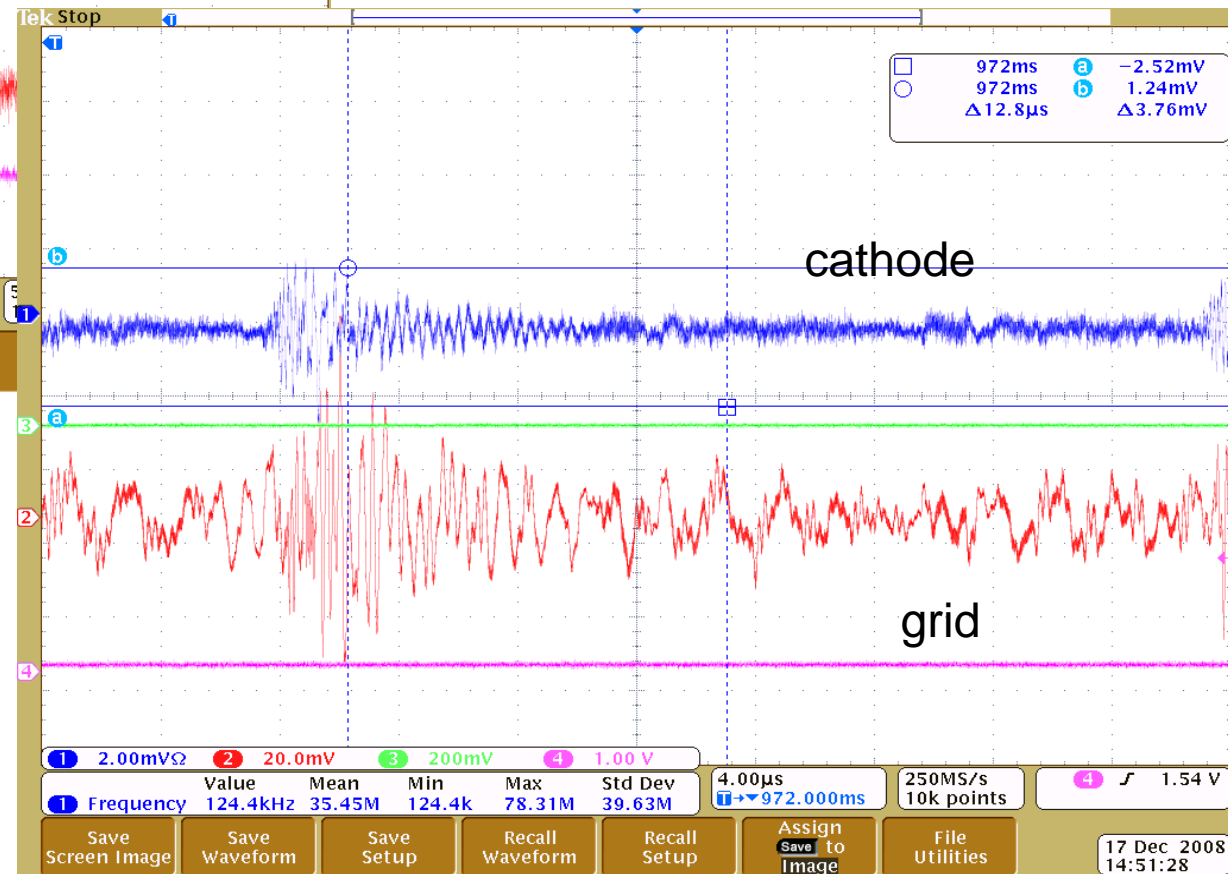


Signal on MI RFA. Looks like NOISE

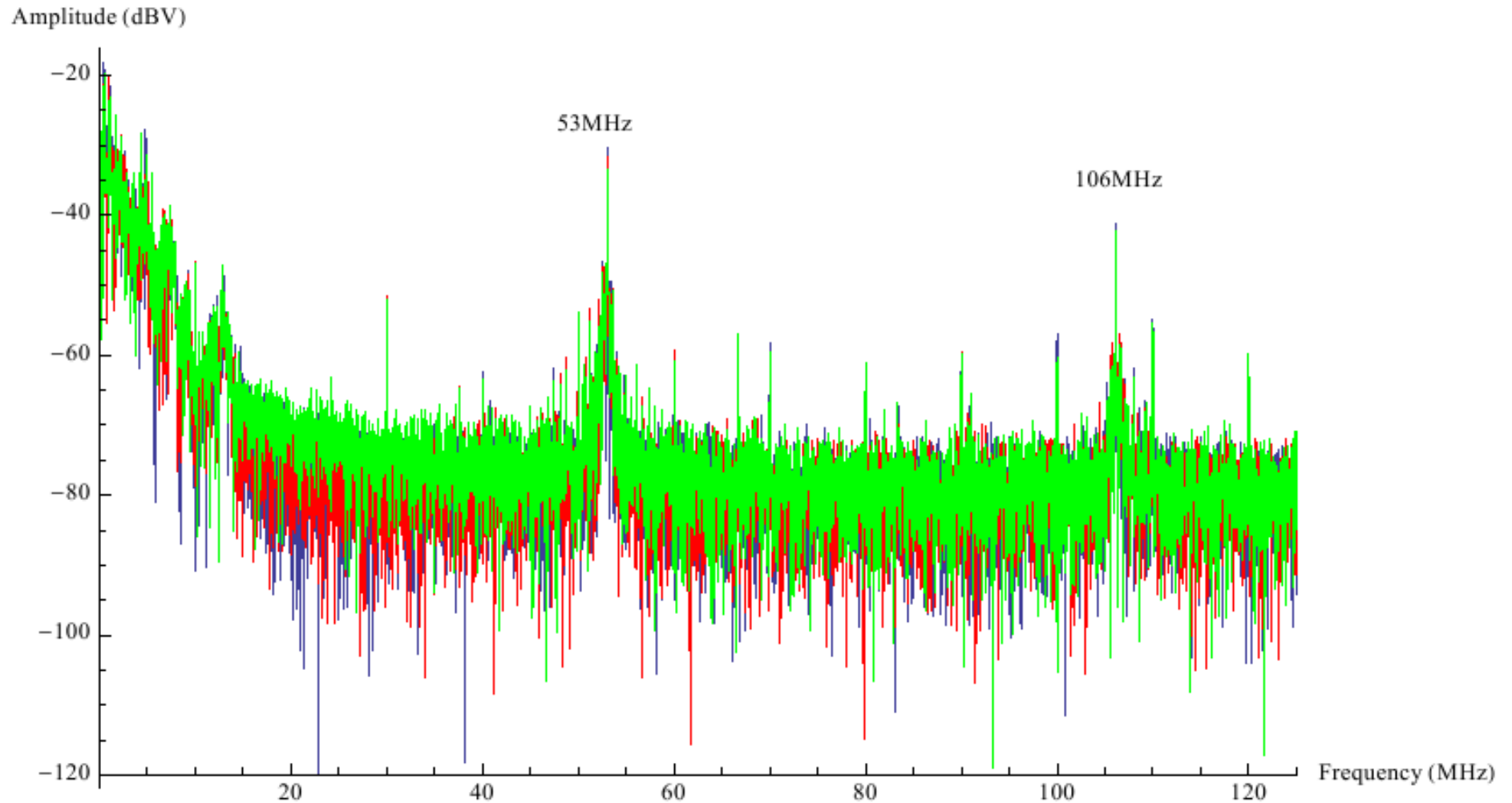


Attenuation factor between cathode and grid = $3.76/50.8 = 0.074 = -22\text{dB}$.

Looks suspiciously to be on the grid rather than cables.



Fourier transforming the grid signal

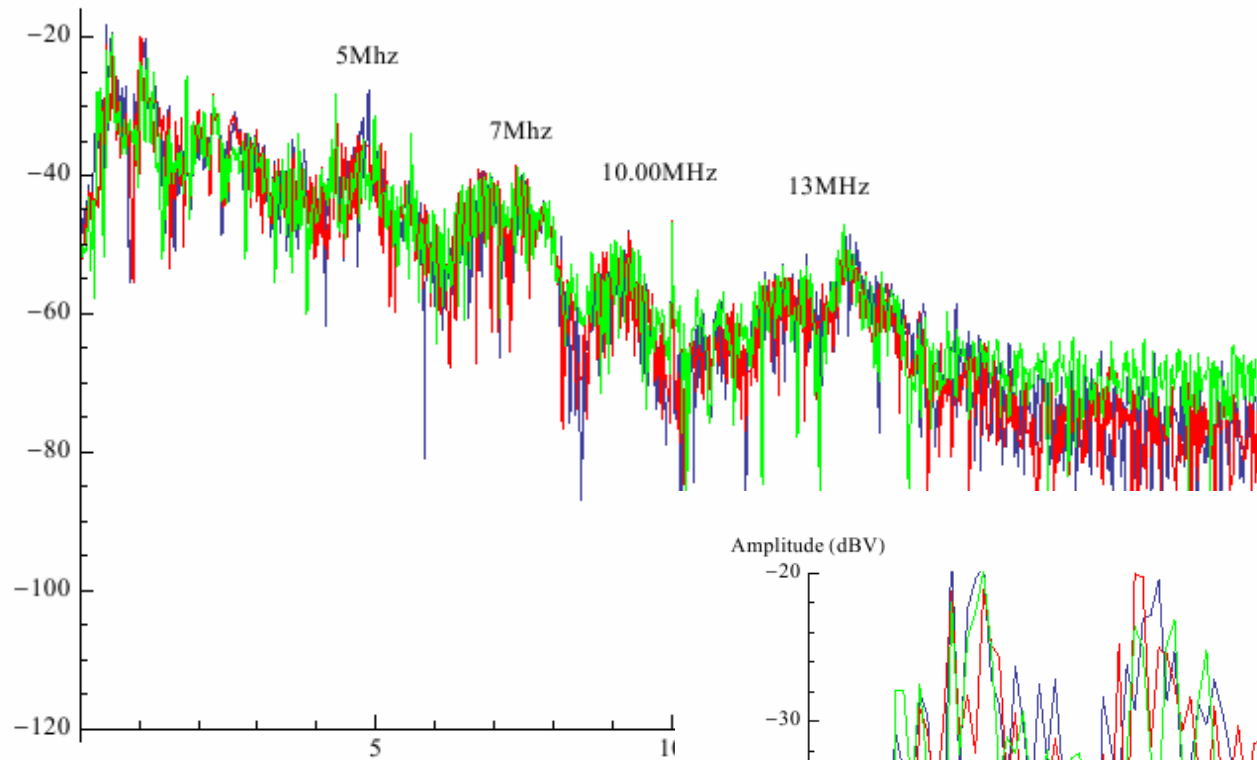


More details in rfa.pdf

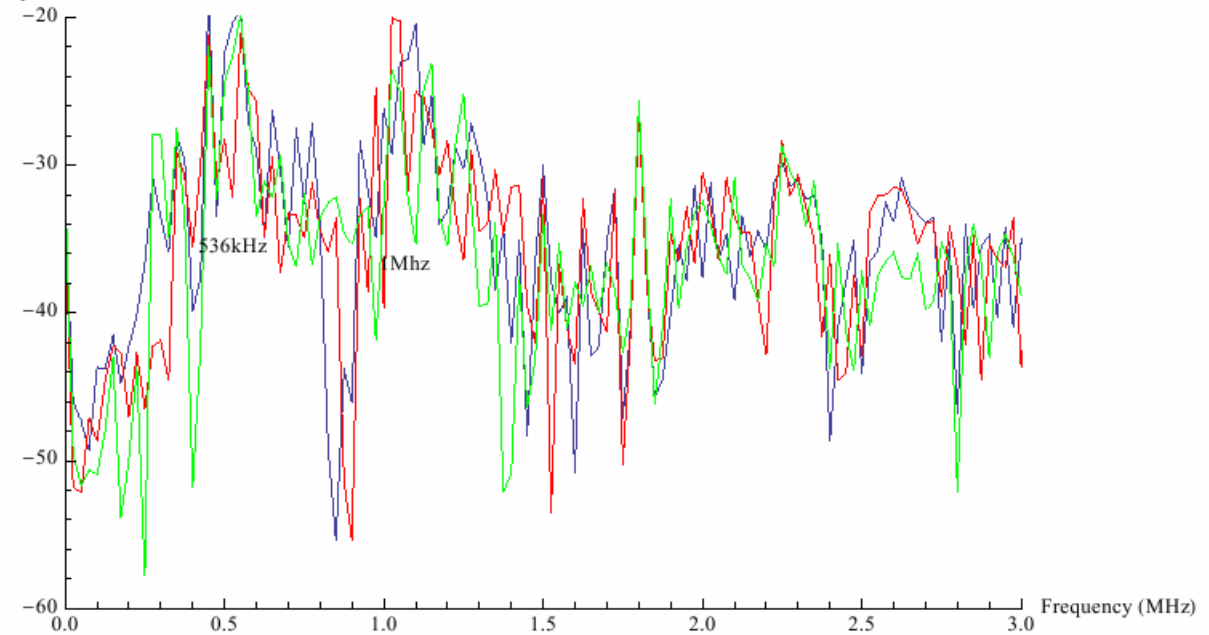
Real Beam

Zoomed in

Amplitude (dBV)



Amplitude (dBV)



Conclusion

- I need to make a few more measurements on real beam: I want to see the 10kHz line.
- Measure with ANL RFA on test bench.
- Network Analyzer measurement to get impedance.
- I think I know what is needed for the electronics.
 - We have the rad hard parts
 - I need \$20 rad hard transistors.
 - Simulate and build!